



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.  
Secretary of Natural Resources

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Robert G. Burnley  
Director

Steven A. Dietrich  
Regional Director

**STATE WATER CONTROL BOARD ENFORCEMENT ACTION  
SPECIAL ORDER BY CONSENT  
ISSUED TO  
THE WESTERN VIRGINIA WATER AUTHORITY  
FOR  
THE ROANOKE REGIONAL WATER POLLUTION CONTROL PLANT  
VPDES Permit No. VA0025020**

### **SECTION A: Purpose**

This is a Consent Special Order issued under the authority of Va. Code §62.1-44.15(8a) by the State Water Control Board to the Western Virginia Water Authority ("Authority"), for the purpose of resolving certain alleged violations of State Water Control Law and the Regulations. This Order recognizes the recent creation of the Authority and the transfer of the Plant as well as the City and County sewage collection and transmission systems ("Collection System") and the associated transfer of VPDES Permit No. VA0025020 to the Authority. To facilitate the implementation of infrastructure and operational enhancements, this Order establishes new requirements for evaluation of the Authority's sewage collection and transmission systems. New requirements include identifying sources of I&I that lead to system overflows and Plant bypasses, prioritizing and implementing interim actions to reduce I&I, developing and implementing a long-term corrective action plan including I&I reduction and increased conveyance and treatment capacity, and performing those actions on an approved schedule.

### **SECTION B: Definitions**

1. "Va. Code" means the Code of Virginia (1950), as amended.
2. "Board" means the State Water Control Board, a permanent citizens' board of the Commonwealth of Virginia as described in Va. Code §§ 62.1-44.7 and 10.1-1184.
3. "Department" or "DEQ" means the Department of Environmental Quality, an agency of the Commonwealth of Virginia as described in Va. Code § 10.1-1183.

4. "Director" means the Director of the Department of Environmental Quality.
5. "Order" means this document, also known as a Consent Special Order.
6. "Plant" means the Western Virginia Water Authority Water Pollution Control Plant, formerly known as the Roanoke Regional Water Pollution Control Plant, which operates under VPDES Permit No. VA0025020.
7. "WCRO" means the West Central Regional Office of DEQ, located in Roanoke, Virginia.
8. "Permit" means VPDES Permit No. VA0025020, which was reissued to the City of Roanoke to operate the Roanoke Regional Water Pollution Control Plant on May 14, 2004 and transferred to the Authority on July 21, 2004.
9. "Regulations" means the VPDES Permit Regulation, 9 VAC 25-31-10 *et seq.*
10. "Inflow and Infiltration" or "I&I" means non-sewage waters entering the sanitary sewer system.
11. "Bypass", as defined at 9 VAC 25-31-10, means the intentional diversion of waste streams from any portion of a treatment facility.
12. "Overflow" means a discharge of wastewater from a sanitary sewer collection or transmission system caused by hydraulic overload or maintenance problems.
13. "City" means the City of Roanoke, Virginia.
14. "County" means the County of Roanoke, Virginia.
15. "CAP" means the Corrective Action Plan required under Paragraph 4 of Appendix A herein.
16. "Contract A" means wet weather improvements including, but not limited to, construction of a new influent pumping structure, new wastewater screening structure, grit basins and new grit classifiers, primary clarification improvements including construction of three new clarifiers, new chemical feed facilities for disinfection and phosphorus removal, and all required and associated work as described in the specifications and shown on the drawings.
17. "Contract B" means process train improvements including, but not limited to, work to convert the existing two-stage activated sludge process to a single-stage activated sludge process, upgrade of the existing clarifiers and RAS pump stations, construction of new secondary clarifiers and RAS pump station, effluent filter modifications, construction of a new filter bypass structure, DAF building modifications, anaerobic digester modifications, a new waste gas burner, a new boiler building, yard piping, sitework, flood protection

improvements, miscellaneous plant improvements, and all required and associated work as described in the Specifications and shown on the Drawings.

**SECTION C: Findings of Fact and Conclusions of Law**

1. The Authority was formed pursuant to the Virginia Water and Waste Authorities Act, Va. Code § 15.2-5100 *et seq.*, on March 3, 2004 by the City and the County for the purpose of managing water and wastewater for the City, the County, and other local users. Title to certain assets of the City and County, including the Plant and the Collection System was transferred to the Authority on July 1, 2004. Approval for the transfer of VPDES Permit No. VA0025020 was granted by DEQ on July 21, 2004.
2. The Plant provides advanced treatment for wastewater generated by citizens, businesses and institutions in the City of Salem, the Town of Vinton, and Botetourt County (collectively, the "Localities") as well as in the City and County. Wastewater is collected in each of these jurisdictions and conveyed to the Plant by means of the Localities' satellite sanitary sewer collection and transmission systems and the Authority's Collection System.
3. The Plant and the Collection System are jointly used by the Authority and the Localities pursuant to the 2003 Regional Wastewater Collection and Treatment Contract dated November 1, 2003, which establishes the rights and obligations of the parties with respect to the use of the aforementioned facilities.
4. I&I is believed to be occurring in some of the portions of the satellite collection system owned and operated by the Localities as well as the Collection System owned and operated by the Authority. It is further believed that I&I leads to overflows in the Collection System and it is also believed to be a significant contributing factor to bypasses and VPDES Permit effluent limit violations at the Plant.
5. The City, in cooperation with the Board and DEQ, has made significant progress over the past decade in addressing I&I in the collection system, thereby reducing hydraulic overloading of the Plant, collection system overflows, and Plant bypasses. The most significant progress has been in the area of reducing wet weather overflows within that portion of the collection system located within City limits. The City and its partner jurisdictions have invested more than \$90 million in undertaking capital projects. This effort has been guided by a series of consent special orders issued by the Board, which are described in paragraphs 6 through 9 below.
6. On October 3, 1990, the Board issued a Consent Order to the City to address flows to the Plant in excess of 95% of design. The 1990 Order included provisions for I&I reduction which, among other things, required completion of storm drain construction and smoke testing to confirm the absence of combined sewer connections in Roanoke's Williamson

Road area; obtaining written agreements with the County, City of Salem, the Town of Vinton, Botetourt County regarding funding and implementation of I&I programs for those localities; and development of a systemwide I&I identification and correction program.

7. On August 10, 1992, the Board issued a Consent Order to the City that superceded the 1990 Order. The 1992 Order was issued to address continuing collection system overflows, continuing flows at the Plant in excess of 95% of design, and violations of the Permit and an EPA administrative order which required implementation of a pretreatment program. The 1992 Order included provisions for I&I reduction, which, among other things, again required that Roanoke implement a system-wide I&I identification and correction program to reduce flows to the Plant to less than 35 MGD. A list of prioritized projects to be completed under the I&I program was to be submitted by December 1992. One of the projects resulted in the replacement of the Tinker Creek Interceptor.
8. On April 30, 1997, the 1992 Order was amended to address violations of Permit effluent limits caused by high Plant flows. The 1997 Amendment recognized that while certain I&I work had been performed, flows to the Plant could not be reduced below 35 MGD with I&I reduction alone. Accordingly, the 1997 Amendment included interim loading limits and a requirement to increase the capacity of the Plant from 35 to 62 MGD.
9. On December 10, 1999, the Board issued a fourth order. The 1997 Amendment stated that both it and the 1992 Order would expire upon reissuance of the Permit. Because the Permit was reissued in February 1999, the 1992 Order and the 1997 Amendment expired on that date. Because the I&I reduction projects and the Plant upgrade required by the 1997 Amendment had not been completed as of the time the Amendment expired, the 1999 Order reinstated the interim effluent limits and revised the schedules for completion of the requirements of the 1997 Amendment.
10. Although upgrades to the Plant were completed as of the deadline in the 1999 Order, the upgrades did not result in the expected increase in Plant capacity to 62 MGD. Due in part to the outcome of the Plant upgrade completed in 2000 and notwithstanding the completion of the I&I reduction projects under the above-referenced consent orders, the Plant has experienced and continues to experience bypassing and exceedences of effluent limits during wet weather events. Moreover, the Collection System has experienced and continues to experience overflows. It is recognized that the Collection System response in wet weather events is not unique to the Western Virginia Water Authority wastewater system as utilities both in the Commonwealth and nationally seek to address wet weather issues.
11. On July 8, 2002, the Board issued a Consent Order to the City ("2002 Order") to address bypasses and Permit effluent limit exceedences at the Plant. Because the Plant upgrade completed under the 1997 Amendment did not provide the expected increase in treatment

capacity, the 2002 Order required: a) commencement of additional upgrades to the Plant, including improvements in both capacity and equalization; b) disinfection of bypasses; c) evaluation of flow meters in the collection system, and d) upgrade of existing meters or installation of new meters in accordance with the findings of the evaluation, in order to provide information on sources of I&I within the collection system. The 2002 Order did not otherwise address I&I problems.

12. On December 10, 2002, the Department issued Warning Letter ("WL") No. W2002-12-W-1005 to the City. The WL referenced overflows in the City's portion of the Collection System (estimated at 1,000 to 1,500 and 500 gallons, respectively) that had occurred on September 11 and 14, 2002.
13. On February 21, 2003, the Department issued WL No. W2003-02-W-1008 to the City. The WL referenced overflows in the City's portion of the Collection System (estimated at 2000 and 200 gallons, respectively) that had occurred on December 13 and 27, 2002.
14. On April 3, 2003, the Department issued Notice of Violation ("NOV") No. W2003-04-W-0002 to the City. The NOV referenced an overflow in the City's portion of the Collection System (estimated at 3,000 gallons) that had occurred on February 6, 2003 as well as a violation of a pH Permit effluent limit that occurred in March 2003.
15. On July 15, 2003, DEQ issued NOV No. W2003-07-W-0002 to the City. The NOV alleged that the City had failed to comply with the flow metering evaluation and upgrade requirements of the 2002 Order. The NOV also alleged that the City had violated effluent limits at the Plant for chlorine in February 2003 and for Total Suspended Solids ("TSS") in October 2002.
16. On August 8, 2003, the Department issued NOV No. W2003-08-W-0004 to the City. The NOV referenced a total of eight overflows in the City's portion of the Collection System, ranging in estimated volume from 1,500 gallons to 20 gallons, that had occurred during the week of June 16th, 2003 and the week of June 23rd, 2003. The NOV also alleged that the City did not report the overflows as required by its Permit.
17. On September 10, 2003, the Department issued NOV No. W2003-09-W-0005 to the City. The NOV listed an overflow of approximately 100 gallons on July 2, 2003 and an overflow in City's portion of the Collection System of unknown quantity that occurred on July 7, 2003. The NOV also cited a violation for the month of July 2003 of the Total Kjeldahl Nitrogen ("TKN") maximum limit specified in the Permit.
18. On October 8, 2003, the Department issued NOV No. W2003-10-W-0005 to the City. The NOV alleged that the City had violated effluent limits at the Plant for pH and TKN in August

2003.

19. On November 12, 2003, the Department issued NOV No. W2003-11-W-0007 to the City. The NOV alleged that the City had not submitted a complete application for Permit reissuance by the deadline specified in the VPDES Permit Regulation.
20. On December 10, 2003, the Department issued NOV No. W2003-12-W-0005 to the City. The NOV alleged that the City had violated effluent limits at the Plant for Phosphorus in October 2003. The NOV also referenced overflows in the City's portion of the Collection System of 400 and 100 gallons respectively, that occurred on October 2 and October 17, 2003.
21. On January 8, 2004, the Department issued NOV No. W2004-01-W-005 to the City. The NOV listed an overflow in City's portion of the Collection System of approximately 50 gallons that occurred on November 11, 2003 and an overflow in the City's portion of the Collection System of approximately 10,000 gallons that occurred on November 19, 2003.
22. On October 8, 2004, the Department issued NOV No. W2004-10-W-0001 to the Authority. The NOV listed overflows, effluent limit violations, and reporting violations that occurred in August 2004.
23. On November 16, 2000, the Department issued WL No. 00-11-WCRO-008 to the County. The WL listed overflows in the City's portion of the Collection System that had occurred on July 30 (two discharges estimated at 75,000 and 60,000 gallons) and July 31, 2000 (one discharge estimated at 40,000 gallons).
24. On April 25, 2001, the Department issued WL No. 01-04-WCRO-006 to the County. The WL listed two overflows, each estimated at 90,000 gallons, in the City's portion of the Collection System that had occurred on September 1, 2000.
25. On July 9, 2001, the Department issued WL No. 01-07-WCRO-002 to the County. The WL listed two overflows estimated at 84,000 and 3,000 gallons in the City's portion of the Collection System that had occurred on April 1, 2001.
26. On August 8, 2003, the Department issued WL No. 03-08-WCRO-011 to the County. The WL listed overflows in the County's portion of the Collection System that occurred on June 14 (approximately 51,000 gallons), June 16 (six discharges estimated at 60,000, 365,000, 90,000, 45,000, 18,000, and 50,000 gallons), June 19, 2003 (three discharges estimated at 45,000, 30,000, and 15,000 gallons).
27. On September 12, 2003, the Department issued WL No. 03-09-WCRO-005 to the County.

The WL listed four overflows in the County's portion of the Collection System that occurred on July 2, 2003. Estimated volumes of these overflows were 288,000, 84,000, 16,500, and 9,000 gallons.

28. On November 14, 2003, the Department issued WL No. 03-11-WCRO-002 to the County. The WL listed an overflow in the County's portion of the Collection System of approximately 1,050 gallons that occurred on September 26, 2003.
29. On January 8, 2004, the Department issued NOV No. 04-01-WCRO-003 to the County. The NOV listed an overflow in the County's portion of the Collection System of approximately 72,000 gallons that occurred on November 19, 2003.
30. On April 14, 2004, the Department issued NOV No. 04-04-WCRO-003 to the County. The NOV listed three overflows in the County's portion of the Collection System of approximately 9,000, 6,000, and 840 gallons that occurred on February 6, 2004.
31. On May 18, 2004, the Department issued NOV No. 04-05-WCRO-011 to the County. The NOV listed an overflow in the County's portion of the Collection System of unknown volume that occurred on March 8, 2004.
32. On June 7, 2004, the Department issued NOV No. 04-06-WCRO-005 to the County. The NOV listed overflows that occurred in the County's portion of the Collection System on March 8, 2004 (unknown volume), April 13, 2004 (three overflows estimated at 1,500 gallons, 48,000 gallons, and 76,500 gallons), and April 19, 2004 (estimated at 2,000 gallons).
33. Va. Code § 62.1-44.5.A and 9 VAC 25-31-50.A prohibit the discharge of sewage or other wastes into State waters, by any person, except in compliance with a certificate or permit issued by the Board. Va. Code § 62.1-44.31 states that "[I]t shall be unlawful for any owner to fail to comply with any special order adopted by the Board....". Va. Code § 62.1-44.3 defines "person" to include any governmental body. Va. Code § 62.1-44.3 defines "owner" to include any political subdivision of the Commonwealth that owns a facility that has the capability to alter the physical, chemical, or biological properties of State waters or "discharge into state waters sewage, industrial wastes, or any noxious or deleterious substance" in contravention of § 62.1-44.5. Accordingly, prior to the transfer of the Plant and the Collection System to the Authority, the City and the County were both an owners and persons as defined by the Code. Subsequent to such transfer, the Authority is both an owner and a person as defined by the Code. The Authority has agreed to assume, and with this Order, settle the liability of the City and the County, respectively, for the violations alleged herein.
34. Since issuance of the 2002 Order, the Authority has developed a comprehensive program for

addressing overflows in the Collection System. Accordingly, this Order addresses the conditions described above by establishing a program to further reduce I&I and to further upgrade the Plant. Reduction of I&I will act to further minimize overflows in the Collection System, and, during the period of Plant upgrade will minimize Plant bypasses and Permit effluent limit exceedences. Completion of the Plant upgrade will improve the consistency of compliance with Permit effluent limits and reduce Plant bypasses.

35. On September 30, 2004, the Authority submitted a plan and schedule to DEQ for dissemination of public information regarding the inappropriateness of unauthorized sump pump, roof, and building drain connections.
36. Since issuance of the October 8, 2004 NOV to the Authority, other collection system overflows, including overflows from the Tinker Creek Interceptor and the Garst Mill Interceptor, Plant overflows and bypasses, and permit violations have occurred and have been reported by the Authority to DEQ.

#### **SECTION D: Agreement and Order**

By virtue of the authority granted it pursuant to Va. Code §62.1-44.15, the Board orders the Authority, and the Authority agrees, to perform the actions described in Appendix A, Appendix B, Appendix C, Appendix D, and Appendix E of this Order.

#### **SECTION E: Administrative Provisions**

1. The Board may modify, rewrite, or amend the Order with the consent of the Authority, for good cause shown by the Authority, or on its own motion after notice and opportunity to be heard.
2. This Order only addresses and resolves the issues specifically identified herein. This Order shall not preclude the Board or the Director from taking any action authorized by law, including but not limited to: (a) taking any action authorized by law regarding any additional, subsequent, or subsequently discovered violations; (b) seeking subsequent remediation of the Plant and/or the Collection System as may be authorized by law; or (c) taking subsequent action to enforce this Order. This Order shall not preclude appropriate enforcement actions by other federal, state, or local regulatory authorities for matters not addressed herein.
3. For purposes of this Order and subsequent actions with respect to this Order, the Authority admits the jurisdictional allegations in this Order, but does not admit the factual allegations or legal conclusions contained herein. The Board and the Authority agree that the actions undertaken by the Authority in accordance with this Order do not constitute an admission of any liability by the Authority. The Authority does not admit, and retains the right to



controvert in any subsequent proceedings other than proceedings to implement or enforce this Order, the validity of the Findings of Fact and Conclusions of Law contained in Section C of this Order.

4. The Authority declares that it has received fair and due process under the Administrative Process Act, Va. Code §§ 2.2-4000 *et seq.* and waives the right to any hearing or other administrative proceeding authorized or required by law or regulation, and to any judicial review of any issue of fact or law contained herein. Nothing shall be construed as a waiver of the right to any administrative proceeding for, or to judicial review of, any action taken by the Board or the Director to enforce this Order.
5. Failure by the Authority to comply with any of the terms of this Order shall constitute a violation of an order of the Board. Nothing herein shall waive the initiation of appropriate enforcement actions or the issuance of additional orders as appropriate by the Board or the Director as a result of such violations. Nothing herein shall affect appropriate enforcement actions by any other federal, state, or local regulatory authority.
6. If any provision of this Order is found to be unenforceable for any reason, the remainder of the Order shall remain in full force and effect.
7. The Authority shall be responsible for failure to comply with any of the terms and conditions of this Order unless compliance is made impossible by earthquake, flood, other acts of God, war, strike, or other such occurrences beyond the Authority's control. The Authority shall show that such circumstances were beyond its control and not due to a lack of good faith or diligence on its part. The Authority shall notify the WCRO Regional Director in writing when circumstances are anticipated to occur, are occurring, or have occurred that may delay compliance or cause noncompliance with any requirement of this Order. Such notice shall set forth: (a) the reasons for the delay or noncompliance; (b) the projected duration of any such delay or noncompliance; (c) the measures taken and to be taken to prevent or minimize such delay or noncompliance; and (d) the timetable by which such measures will be implemented and the date full compliance will be achieved. Failure to so notify the WCRO Regional Director within seventy-two hours of learning of any condition above, which the parties intend to assert will result in the impossibility of compliance, shall constitute a waiver of any claim of inability to comply with a requirement of this Order.
8. This Order is binding on the parties hereto, their successors in interest, designees and assigns, jointly and severally.
9. This Order shall become effective upon execution by both the Director or his designee and the Authority. Notwithstanding the foregoing, the Authority agrees to be bound by any compliance date that precedes the effective date of this Order.

10. Any plans, reports, schedules or specifications attached hereto or submitted by the Authority and approved by the Department pursuant to this Order are incorporated into this Order. Any non-compliance with such approved documents shall be considered a violation of this Order.
11. This Order shall supercede the 1999 Order, which is hereby terminated, and shall continue in effect until either: a) the Authority petitions the Director or his designee to terminate the Order after it has completed all of the requirements of the Order and the Director or his designee approves the termination of this Order, or b) the Director or Board terminates this Order in his or its sole discretion upon 30 days written notice to the Authority. Termination of this Order, or any obligation imposed in this Order, shall not operate to relieve the Authority from its obligations to comply with any statute, regulation, permit condition, other order, certificate, certification, standard, or requirement otherwise applicable.
12. By the signature of an authorized official below, the Authority voluntarily agrees to the issuance of this Order.
13. The undersigned representative of the Authority certifies that he or she is a responsible official authorized to enter into the terms and conditions of this Order and to execute and legally bind the Authority to this document. Any documents to be submitted pursuant to this Order shall also be submitted by a responsible official of the Authority.

And it is so ORDERED this 18<sup>th</sup> day of MARCH, 2005.

*For* Steven A. Dietrich  
Robert G. Burnley, Director  
Department of Environmental Quality

The Western Virginia Water Authority voluntarily agrees to the issuance of this Order.

By: Michael W. Altizer  
Michael W. Altizer, Chair

Commonwealth of Virginia

City/County of Roanoke

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Special Order by Consent  
Western Virginia Water Authority

The foregoing instrument was acknowledged before me this 23rd day of December, 2004,  
by Michael W. Altizer, who is Chairman of the Board of the  
Western Virginia Water Authority, on behalf of said Authority.

Jean M. Thurman  
Notary Public

My commission expires: 6-30-06

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**APPENDIX A**  
**I&I Evaluation and Corrective Action**

1. Flow Monitoring. The Authority shall comply with the Flow Monitoring Plan it submitted to DEQ on July 20, 2004.
2. Initial Interim I&I Corrective Action Projects.
  - a. Not later than March 31, 2005, the Authority shall complete the following repairs or replacements of its sewage collection system.

Location of Repairs	Line Size (inches)	Linear Feet of Repair Or Replacement
2424 Brambleton Ave., S.E.	8	550
3100 Block, Oaklawn Ave., N.W.	8	270
3710 Londonberry Dr., S.W.	8	390
2600 & 2700 Block Stephenson Ave., S.W.	8	450
Behind Oleva St., N.W.	8	400
Behind 4340 Plantation Rd., N.E.	8	768
3700 to 3800 Blocks, Salem Turnpike	8	400
Beginning 3313 Garst Mill Rd., S.W.	8	240

- b. Additional Interim I&I Corrective Action Projects due by 2005. Not later than March 31, 2005, the Authority shall submit to DEQ for review and approval a schedule with construction completion deadlines for interim I&I reduction projects to be performed by December 30, 2005, which upon its approval shall become a part of and enforceable under the terms of this Order.
    - c. Additional Interim I&I Corrective Action Projects due by 2007. Not later than December 30, 2005, the Authority shall submit to DEQ for review and approval a schedule with construction completion deadlines for additional interim I&I reduction or line capacity projects to be performed by January 30, 2007, which upon approval shall become a part of and enforceable under the terms of this Order. This schedule shall be based on the CSES Report Outline described at Paragraph 3 below.
    - d. Garst Mill Park Static Flow Model. Not later than July 30, 2005, the Authority shall submit to DEQ a static flow model of the Roanoke River Interceptor to the point of its conjunction with the Garst Mill sub-interceptor and a static flow model of the sub-interceptor serving the Garst Mill Park area of the County.

- e. Garst Mill Park Corrective Action. Not later than October 30, 2005, the Authority shall submit to DEQ for review and approval a plan and schedule for prevention of overflows in the Garst Mill Park area of the County by July 30, 2007 (the "Garst Mill Plan"). Upon its approval, the Garst Mill Plan shall become a part of and enforceable under the terms of this Order.

3. Collection System Evaluation Study ("CSES") and Associated Field Activities

- a. Previous Studies. Not later than March 31, 2005, the Authority shall provide to DEQ a listing and summary of previous studies and records, field reports, and other pertinent information generated from previous studies in the possession of the Authority that the Authority proposes to use in the development of the final CSES.
- b. Old Roanoke River Interceptor Report. Not later than March 31, 2005, the Authority shall provide to DEQ, for its review and approval, a separate report on the condition of the sections of the old Roanoke River Interceptor still connected to the new Roanoke River Interceptor. The report shall include recommendations for future replacement or upgrade of the old Roanoke River Interceptor sections and shall prioritize these repairs, as appropriate, into two categories: (i) repairs appropriate for inclusion in the March 31, 2005 additional projects submission under Paragraph 2.b above, and (ii) repairs appropriate for evaluation and inclusion in the CAP. Upon its approval, implementation of the recommendations of said report shall become a part of and enforceable under the terms of this Order.
- c. Root Control Pilot Project. Not later than March 31, 2005, the Authority shall complete a pilot project on root control and submit a written report to DEQ describing the results of the project. For a period of four years, the Authority shall submit an annual report in accordance with Paragraph 3.a of Appendix D herein describing the re-growth of roots in the pilot project area. The Authority shall utilize the results of this pilot project in the development of the Collection System Operation and Maintenance Plan required under this Appendix A.
- d. River Crossing Field Investigations. Not later than March 31, 2005, the Authority shall submit to DEQ an interim report describing the results of investigations of the condition of existing Collection System river and creek crossings along the Roanoke River, Tinker Creek, Peters Creek, Lick Run, Mudlick Creek, Murray Run, Barnhart Creek, and Ore Branch. The Authority shall consider the results of these investigations in developing the submittals required under Paragraphs 2.b and 2.c above and the CAP.

- e. Residential Pilot Project. Not later than March 31, 2005, the Authority shall develop and submit to DEQ for review and approval a plan and schedule for a pilot project to demonstrate reduction or elimination of I&I from house laterals, foundation/yard drains, and sump pumps connected to the Collection System. The scope of the project area shall include, at a minimum, 600 homes. The plan shall explain the rationale for the homes selected. The plan shall include provisions for flow monitoring before and after completion of I&I reduction measures in order to evaluate the effectiveness of the measures. Upon its approval the Authority shall complete the Residential Pilot Project, under the terms of this Order, by April 30, 2006. The Authority shall continue flow monitoring in Project area(s), and shall continue to submit annual flow monitoring reports, as specified at Paragraph 3.b of Appendix D herein, until DEQ informs the Authority that sufficient flow data has been reported to provide a conclusive evaluation of the effectiveness of the Project.
- f. Manhole / Sewer Line Pilot Project. Not later than March 31, 2005, the Authority shall develop and submit to DEQ for review and approval a plan and schedule for a pilot project to reduce or eliminate I&I from manholes and sewer lines in a selected pilot area. The results of pilot project are anticipated to be used in the formulation of a future, system-wide project to correct manhole and sewer line deficiencies that contribute to I&I. The plan shall explain the rationale for the Project area(s) selected and shall include provisions for flow monitoring before and after I&I reduction measures, in order to evaluate the effectiveness of the measures in reducing I&I. Upon its approval, the plan and schedule shall become a part of and enforceable under the terms of this Order. The Authority shall complete the Manhole / Sewer Line Pilot Project by April 30, 2006. The Authority shall continue flow monitoring in Project area(s) and shall continue to submit annual flow monitoring reports, as specified at Paragraph 3.c of Appendix D herein, until DEQ informs the Authority that sufficient flow data has been reported to provide a conclusive evaluation of the effectiveness of the project.
- g. Collection System Evaluation and Study Report Outline. Not later than January 30, 2006, the Authority shall submit to DEQ, for its review and approval, a proposed outline for the final Collection System Evaluation Study ("CSES") Report using the data and materials from significant studies of the Collection System and field activities performed prior to issuance of this Order and the results of all studies, projects, and flow metering completed as of December 30, 2005 pursuant to this Order. The CSES Report Outline shall provide adequate information to identify the primary information expected to be contained in the final CSES as well as any necessary discussion regarding activities that may be undertaken for formation of the final report. The CSES Report Outline shall describe all significant sources of I&I identified as of December 30, 2005 and

shall include a discussion of alternatives and recommendations for further I&I reduction.

- h. Final Collection System Evaluation and Study Report. Not later than July 30, 2006, the Authority shall submit to DEQ, for its review and approval, a Final CSES Report describing the results of all studies, projects, and flow metering performed as of June 30, 2006. The Final CSES Report shall specify and prioritize, in view of the treatment and equalization capacity of the Plant and conveyance capacity of existing lines, recommended levels of I&I reduction in specific portions of the sewershed that would be necessary to eliminate overflows from the collection systems and/or bypasses at the Plant. If the Authority determines that there are combined sewers within the Collection System, then the Final CSES Report shall include a description of how the Authority will comply with EPA's Combined Sewer Overflow Control Policy. The Final CSES report shall include an evaluation of ongoing I&I reduction measures and/or capacity projects, existing Permit effluent limitations and requirements, and water quality objectives to identify options for further reducing bypasses from the Plant equalization basin. This evaluation shall address the benefits of increasing volumetric flow and/or modifying existing effluent limitations at outfall 001, and implementing modified wet weather operating procedures including the potential use of blending. The Final CSES Report shall also include recommended peak flows to be accepted from Botetourt County, the City of Salem and the Town of Vinton at each point at which each of these localities is connected to the Authority's Collection System.
4. Corrective Action Plan. Based upon the conclusions and recommendations of the Final CSES Report, as approved by DEQ, the Authority shall not later than January 30, 2007 submit to DEQ for review and approval a Corrective Action Plan with a prioritized schedule of completion of projects to minimize I&I-related overflows and bypasses, including system-wide implementation of any elements of Pilot Projects identified above determined to be effective in reducing I&I. The CAP shall include provisions for elimination or proper management of any peak flows from the Localities identified in the CSES Report that contribute to overflows or bypasses. The CAP shall include a justification of its priorities and a plan to finance the identified I&I elimination projects. The CAP shall consist of phases, with the first phase corresponding to the remaining term of the Permit and subsequent 5-year phases corresponding to the Permit renewal terms. Upon its review and approval by DEQ, the CAP shall become a part of and enforceable under the terms of this Order.
5. Wastewater Collection and Treatment System Program Activities.
  - a. Manhole Field Investigations Mapping. Not later than March 31, 2005, the

Authority shall submit to DEQ a written report describing the results of a conditions evaluation and mapping of approximately 1,000 manholes. The Authority shall consider the results of this evaluation in developing the CAP.

- b. Flow Model Small Lines Report. Not later than March 31, 2005, the Authority shall submit to DEQ for review and approval a report that determines from a review of flow monitoring and other data which, if any, smaller lines (i.e. less than 15 inches in diameter) in the collection system should be included in the system-wide flow model described in Paragraph 5.c below, to develop a comprehensive plan and schedule for system-wide I&I reduction.
- c. Flow Model Development. Not later than July 30, 2006, the Authority shall submit to DEQ for review and approval a system-wide model of flows from collection system lines 15 inches in diameter and above, and any smaller lines identified pursuant to the requirements of Paragraph 5.b above.
- d. Collection System Map. Not later than January 30, 2006, the Authority shall provide to DEQ a Collection System map identifying the location and size of Collection System pipes, interceptors and manholes and providing a general description of the condition these system units.
- e. Authority for Private Connection Management Program. Not later than July 30, 2005, the Authority shall issue or amend the appropriate legal documents that will provide the Authority with the authority to regulate private connections (such as foundation drains, sump pumps and gutters) to the Collection System equivalent to or more stringent than the authority given to the County to regulate private connections.
- f. Post-Construction Desktop Evaluation of the Plant. Not later than July 30, 2006, the Authority shall submit a written report to DEQ describing the results of Desktop evaluations of the treatment capacity, including a determination of daily average influent flow capacity, of the Plant, during varying rainfall events (storm hydrographs). The evaluations shall take into account the improvements to treatment capacity expected as a result of the completion of Plant upgrade projects currently under contract. The evaluations must specify the anticipated size of bypasses at the Plant's equalization basin, necessary to prevent irreparable harm to Plant treatment units, under the varying rainfall scenarios. The rainfall scenarios to be used in the evaluations are those approved under the provisions of Paragraph 1 above. The goal of the evaluations is to define the levels of I&I reduction necessary to eliminate Plant bypasses, should no further Plant upgrades be made. The evaluations shall be utilized in the development of the CSES Report and the CAP.



6. Beginning on or before July 10, 2005, the Authority shall donate at least \$5,000 annually for three years to the Tri Lake Commission to fund debris removal at Smith Mountain Lake.
7. Beginning on or before July 10, 2005, the Authority shall donate at least \$5,000 annually for three years to a responsible local organization or agency to fund Best Management Projects for nonpoint source water pollution reduction in the Smith Mountain Lake watershed.
8. Beginning on or before July 10, 2005, the Authority shall donate at least \$5,000 annually for three years to the Smith Mountain Lake Association for water quality monitoring on Smith Mountain Lake.

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**APPENDIX B**  
**The Plant**

1. Construction. The Authority shall complete construction and apply for a Certificate to Operate the Plant capacity and equalization improvement measures specified in Contracts A and B not later than August 30, 2007.
2. Bypasses. The following conditions are applicable to bypass discharges from PS003 at the Plant:
  - a. Until issuance of a CTO for the improvements contained in Contracts A and B, a bypass discharge occurring when the estimated average daily influent flow to the Plant for the previous 72 hours was less than or equal to 42 MGD, shall be deemed a violation of the Permit, unless the Authority can demonstrate that the conditions of Part II.U of the Permit and 9 VAC 25-31-190.M of the Permit Regulation have been met.
  - b. Not later than March 31, 2005, the Authority shall submit to DEQ, for its review and approval, plans and specifications for modifications to existing equipment and the installation of any additional equipment necessary to ensure adequate disinfection of bypass discharges at PS003.
  - c. Upon approval of the plans and specifications referenced in subparagraph 2.b above, the Authority shall complete installation and/or modification of disinfection equipment within 60 days of approval of plans and specifications by DEQ.
  - d. Not later than March 31, 2005, the Authority shall submit to DEQ, for its review and approval, a Plant operation plan addressing procedures for Plant operations, including operation of disinfection equipment, immediately before, during, and immediately after bypasses at PS003. Upon its approval, said plan shall become a part of and enforceable under the terms of this Order.
  - e. The Authority shall measure fecal coliform concentrations and Biochemical Oxygen Demand ("BOD<sub>5</sub>"), TKN, Total Phosphorus ("TP"), and TSS loadings at outfall PS003 whenever bypasses occur at this location. Such measurements shall be grab samples but shall conform to the analysis requirements contained in the Permit. The Authority shall collect one sample of each parameter, per day, per bypass event. The Authority shall submit the data from these sampling efforts and the information required by the bypass-monitoring plan required by Paragraph 2.d above with the Plant's monthly Discharge Monitoring Reports unless directed otherwise by any reissuance or modification of the Permit.

3. Interim Limits (42 MGD). Effluent limitations in effect at outfall 001 until issuance of CTO for the improvements contained in Contracts A and B are as follows:
  - a. The Authority shall comply with the effluent limitations specified in the Permit when the average daily influent flow at the Plant in any given month is less than or equal to 42 MGD.
  - b. The Authority shall comply with the interim effluent limitations specified in Appendix E of this Order in lieu of the effluent limitations specified in the Permit when the average daily influent flow at the Plant in any given month is greater than 42 MGD.

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## APPENDIX C System-wide Planning and Management

1. Revenue. The Authority shall raise the revenue necessary to implement the approved CAP described in Appendix A hereto, within four years of CAP approval, or to the limit of its financial capabilities. The Authority shall be deemed to be raising CAP funds to the limit of its financial capability if the following criteria are met:
  - a. At least bi-annually the Authority adjusts its sewer rates so that within five years of the date DEQ approves the CAP:
    - (1) The annual sewer bill<sup>1</sup> for typical residential customers (i.e. 5,000 gallons of average monthly use) will be at least 1.25% of median household income<sup>2</sup> in the City; and
    - (2) The sewer volume rate for customers identified as industrial users in the Authority's utility billing records will equal the rate charged to the Authority's residential customers.
  - b. Beginning with the twelve month period following CAP approval, the Authority annually adjusts unobligated sewer system reserve funds to equal no more than 25% of the subsequent year's budgeted operating expenditures.
  - c. Beginning with the year in which this Order is effective, the Authority shall annually seek grant and low interest loan funding for the CAP from federal, state, and other sources offering such funding for sewer or water quality improvements projects.
2. Spending. Each fiscal year following the effective date of this Order the Authority shall allocate and spend all available funds on I&I corrective action projects identified in this Order. Available funds for I&I corrective action projects shall include annual sewer revenues remaining after ordinary expenditures required to administer, operate and maintain the Collection System and the Plant in accordance with federal and state water quality related requirements, expenditures required under the CMOM Plan and capital allocations and expenditures to procure, maintain and replace capital funds and

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<sup>1</sup> Defined as revenue from rates, fees, assessments or charges that sewer customers must pay.

<sup>2</sup> As reflected in the 2000 and any subsequent census. In the years between each census, the median household income (MHI) shall be adjusted based on the percent change in the 2-year moving average for Virginia's MHI as regularly published by the U.S. Census Bureau. If that data is not available, MHI adjustments shall be based upon adjusted gross income (AGI) since the date of the last census as reflected in data published by the Virginia Department of Taxation, or, if that information is not available, the MHI shall be adjusted based on 75% of the percent increase in the consumer price index for that year.

equipment consistent with a prudent asset management program. Available funds for I&I corrective action projects also include any loan and grant funds obtained for the purpose of implementing the CAP.

3. Continuing Capacity, Management, Operation and Maintenance Program. By December 30, 2005, the Authority shall provide DEQ for review and approval, a Capacity, Management, Operation and Maintenance ("CMOM") Plan. Upon its review and approval by DEQ, the CMOM Plan shall become a part of and enforceable under the terms of this Order. The CMOM Plan shall include the following:
  - a. Specification of major goals of the program;
  - b. Identification of administrative and maintenance positions responsible for implementing CMOM program measures, including identification of lines of authority by organization chart or similar document and the chain of communication for reporting overflows;
  - c. A description of legal authority, through sewer use ordinance, service agreements or other legally binding documents, to:
    - (1) Control infiltration and connections from inflow sources;
    - (2) Require that sewers and connections be properly designed and constructed;
    - (3) Ensure proper installation, testing, and inspection of all new and rehabilitated portions of the Collection System;
    - (4) Address flows from satellite collection systems;
  - d. Identification of certain Plan elements, specifying the person or position within the Authority responsible for each element and indicating current staffing and resource commitments to carry out each element, including, but not limited to:
    - (1) Maintenance of facilities and equipment;
    - (2) Maintenance of a map of the Collection System;
    - (3) Management of information and use of timely, relevant information to establish and prioritize appropriate CMOM activities, and identify and illustrate trends in overflows, such as frequency and volume;
    - (4) Routine preventative operation and maintenance activities.

- (5) A schedule of preventive maintenance activities, which shall include, but not be limited to, the following:
  - A. Periodic service and calibration of all instrumentation, including flow meters, liquid level sensors, alarm systems, elapsed time meters, and remote monitoring equipment;
  - B. Routine inspection and service of each pump station, including engines, motors, generators, pumps, wet wells, valves, and related equipment;
  - C. Periodic inspection and testing and, if necessary, servicing of all pumps including impellers, seals, and bearings, wear clearances, couplings, drives and motors; and
  - D. Routine inspection and service for mainlines sewers, manholes, siphons, and other appurtenances.
- e. Design and performance provisions, which shall include, but not be limited to the following:
  - (1) Requirements and standards for the installation of new sewers, pumps, and other appurtenances; and rehabilitation and repair projects; and
  - (2) Procedures and specifications for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.
- f. Monitoring, measurement, and program modification provisions, which shall include, but not be limited to the following:
  - (1) Monitoring the implementation and measuring the effectiveness of each element of the Authority's CMOM program;
  - (2) Updating program elements as appropriate based on monitoring or performance evaluations;
  - (3) Updating the Authority's CMOM program, as appropriate, to keep it updated and accurate; and
  - (4) Visual observation and estimation of flows at each Collection System pump station during periods of both dry weather and wet weather to verify the continued effectiveness of the CMOM program and the continued

adequacy of the Collection System and pump stations.

- g. An Overflow Emergency Response Plan that identifies measures to protect public health and the environment. The plan must include mechanisms to:
  - (1) Ensure that overflows (including those that do not discharge to state waters) are addressed appropriately, including ensuring that reports of overflows are immediately dispatched to appropriate personnel for investigation and appropriate response;
  - (2) Ensure appropriate immediate notification to the public, health agencies, other impacted entities (e.g. water suppliers) and DEQ. The CMOM program shall identify the public health and other officials who will receive immediate notification;
  - (3) Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained; and
  - (4) Provide for emergency operations.
- h. If final federal CMOM regulations are promulgated after the CMOM Plan is approved, the Authority may amend the CMOM Plan to make it consistent with the applicable federal regulations.

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**APPENDIX D**  
**Quarterly and Annual Reporting Requirements**

1. Quarterly Report. Beginning April 30, 2005, the Authority shall submit quarterly progress reports to DEQ. Quarterly reports shall be due on January 30, April 30, July 30, and October 30 of each year. Quarterly reports shall include the following elements:
  - a. A description of progress in completing the requirements of Appendix A, Appendix B, and Appendix C of this Order, including the status of any required construction or rehabilitation projects and whether such activities are on schedule for completion within required timeframes.
  - b. Flow Monitoring data collected pursuant to Appendix A, Paragraph 1 of this Order. The flow monitoring component of the quarterly report shall include:
    - (1) Daily average and peak hourly flows from Authority flow monitors and existing master billing meters for Botetourt County, the City of Salem, and the Town of Vinton.
    - (2) Daily readings from the groundwater level monitoring stations included in the map submitted pursuant to Paragraph 1 of Appendix A of this Order,
    - (3) Daily readings from the rain gauges included in the map submitted pursuant to Paragraph 1 of Appendix A of this Order.
2. Annual Financial Report. For each fiscal year during which the Authority relies on the financial test in Paragraph 1 of Appendix C, the Authority shall by the first day of December of the next fiscal year submit an annual financial report to DEQ that includes the following elements:
  - a. An independent rate consultant report that includes schedules and other material designed to demonstrate compliance with the funding and spending criteria specified at Appendix C of this Order. At a minimum, the independent rate consultant's report will include:
    - (1) A schedule of sewer rates and charges in effect during the year and an explanation of any changes in the sewer rates and charges during the year;
    - (2) A schedule that calculates the current year annual sewer bill for a residential customer with a 5,000 gallon average monthly sewer use and the percentage of such bill to median household income in the City;
    - (3) A schedule detailing sewer related revenues, operation and maintenance



expenses, net revenues, debt service and the sewer debt service coverage ratio for the previous year;

- (4) A schedule displaying the beginning balance, additions, uses and ending balance of sewer reserve funds, and a comparison (expressed as a percentage) of the year end reserve balance to the subsequent year's operating expenditure budget;
  - (5) A schedule detailing amounts of borrowed funds, grants, and other sources of capital funds, and the amount of capital funds obligated for sewer projects during the previous year; and,
  - (6) A schedule displaying the industrial rate structure and progress toward the goal of parity between industrial and residential rates.
- b. An accounting of all sums expended on implementation of specific CAP projects in the previous fiscal year and in each fiscal year since the effective date of this Order.
  - c. An accounting of all sums obligated in the current fiscal year and funds projected to be obligated within the next five years for implementation of CAP projects.
  - d. A narrative report of the status of each CAP project including projected completion dates contingent upon funding availability.
  - e. A status report of progress being made in procuring state and federal grants and low interest loans for the purpose of implementing specific elements of the CAP.
3. Annual Pilot Projects Report. Not later than 30<sup>th</sup> day of July of each required year, the Authority shall submit an Annual Pilot Projects Report to DEQ that includes the following elements:
- a. A description of re-growth of roots in the pilot project area for the Root Control Project specified at Paragraph 3 of Appendix A herein.
  - b. Flow monitoring data summaries and conclusions as to the effectiveness of the measures employed in the Residential Pilot Project specified at Paragraph 3 of Appendix A herein.
  - c. Flow monitoring data summaries and conclusions as to the effectiveness of the measures employed in the Manhole / Sewer Line Pilot Project specified at Paragraph 3 of Appendix A herein.
4. All items required to be submitted by this Order shall be submitted to the West Central

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Regional Office of DEQ.

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## APPENDIX E

### B. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. As specified at Appendix B, Paragraph 2 of this Order, the Authority shall comply with the effluent limitations specified in the Permit when the average daily influent flow at the Plant in any given month is less than or equal to 42 MGD. The Authority shall comply with the effluent limitations specified below when the average daily influent flow at the Plant in any given month is greater than 42 MGD.

Such discharges shall be limited and monitored by the permittee as specified below:

<u>DISCHARGE LIMITATIONS</u>				<u>MONITORING REQUIREMENTS</u>		
<u>EFFLUENT CHARACTERISTICS</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Frequency</u>	<u>Sample Type</u>
Flow, (MGD) <sup>(2)</sup>	NL	NA	NA	NL	Continuous	T/I/R
pH (Standard Units)	NA	NA	6.5	9.0	1/Day	Grab
BOD <sub>5</sub>	5.0 mg/l	7.5 mg/l	NA	NL	1/Day	24 HC
Total Suspended Solids	2.5 mg/l	5.0 mg/l	NA	NL	1/Day	24 HC
Fecal Coliform (N/100 ml)	200*	NA	NA	NL	1/Day	Grab
Dissolved Oxygen (mg/l)	NA	NA	6.0	NL	1/Day	Grab
Total Phosphorus	0.2 mg/l	0.3 mg/l	NA	NL	1/Day	24 HC
Cyanide, Total (as CN)	8.1 µg/l	10.0 µg/l	NA	NL	2D/Month	Grab
Total Kjeldahl Nitrogen (April – Sept.)	2.0 mg/l	3.0 mg/l	NA	NL	1/Day	24 HC
Total Kjeldahl Nitrogen (Oct. - March)	4.0 mg/l	5.0 mg/l	NA	NL	1/Day	24 HC
Nickel, Total Recoverable	29.6 µg/l	36.4 µg/l	NA	NL	2D/Month	24 HC
Chromium, Hexavalent	7.7 µg/l	9.5 µg/l	NA	NL	2D/Month	Grab
Mercury, Total Recoverable	0.014 µg/l	0.018 µg/l	NA	NL	2D/Month	24 HC
Selenium, Total Recoverable	5.1 µg/l	6.2 µg/l	NA	NL	2D/Month	24 HC
Total Residual Chlorine (TRC) <sup>3</sup>	3.1 µg/l	3.9 µg/l	NA	NL	1/Day	Grab

T/I/R = Totalizing, Indicating, Recording; NA = Not applicable; NL = No Limitation, monitoring required; 24 HC = 24 hour composite

\* Geometric Mean

2. The design flow of this treatment facility is 42 MGD.
3. See Part I.B of the Permit for additional TRC limitations and monitoring requirements.
4. See Part I.C of the Permit for Quantification Levels and Reporting requirements for metals, cyanide, and TRC.
5. See Part I.G.5 of the Permit for additional monitoring requirements.
6. There shall be no discharge of floating solids or visible foam in other than trace amounts.